

FIG. 2

```

graph TD
    Start([MPEG  
SPlicing]) --> 121[INPUT DESIRED END  
FRAME OF FIRST CLIP AND  
DESIRED START FRAME  
OF SECOND CLIP]
    121 --> 122[FIND CLOSEST I FRAME  
PRECEDING DESIRED START  
FRAME TO BE THE IN-POINT  
FOR SPlicing]
    122 --> 123[ADJUST CONTENT OF THE  
FIRST CLIP NEAR THE END  
FRAME OF THE FIRST CLIP  
AND ADJUST CONTENT OF  
THE SECOND CLIP NEAR  
THE IN POINT IN ORDER TO  
REDUCE PRESENTATION  
DISCONTINUITY AND  
PREVENT DECODER BUFFER  
OVERFLOW WHEN DECODING  
THE SPliced MPEG STREAM]
    123 --> 124[RE-FORMATTING INCLUDING  
RE-STAMPING OF PTS, DTS  
AND PCR'S FOR AUDIO  
AND VIDEO]
    124 --> End([END])

```

FIG. 3

1. **Introduction**  
 2. **Background**  
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FIG. 4

VIDEO  
SPLICING

DETERMINE THE LAST DTS/PTS  
OF THE FIRST CLIP  
(DTS<sub>1</sub>)

DETERMINE THE TIME OF ARRIVAL ( $T_e$ ) OF THE LAST BYTE OF THE FIRST CLIP

ADD ONE FRAME INTERVAL  
TO  $DTS_{L1}$  TO FIND THE  
DESIRED FIRST DTS LOCATION  
FOR THE SECOND CLIP  
( $DTS_{F1} = DTS_{L1} + 1/FR$ )

KEEPING THE DTS-PCR<sub>e</sub>  
RELATION UNALTERED FOR  
THE SECOND CLIP, FIND THE  
TIME INSTANT  $T_s$  AT WHICH  
THE FIRST BYTE OF THE  
SECOND CLIP SHOULD  
ARRIVE

$$(T_{\text{START}} = \text{DTS}_{F2} - \text{PCRe}_2)$$

$$(T_S = D T_{SF1} - T_{START})$$

B

FIG. 5



FIG. 7

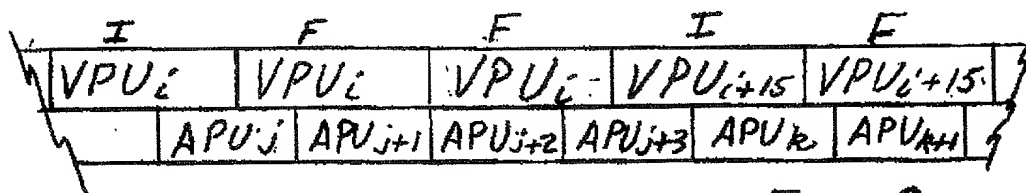


FIG. 8

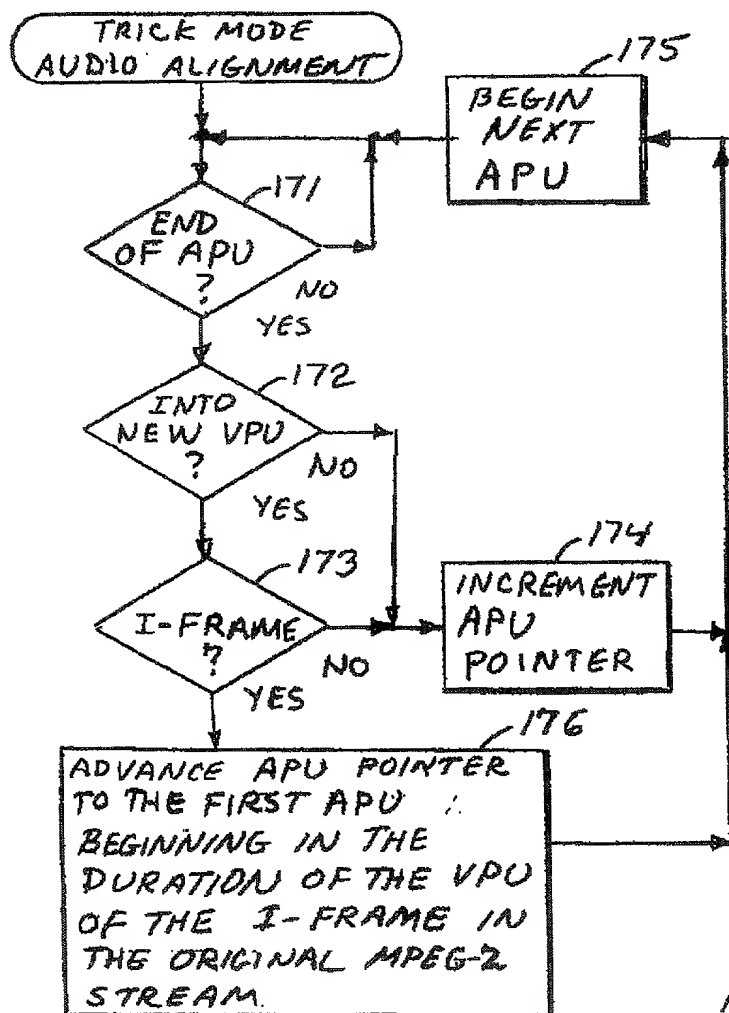


FIG. 9

```

graph TD
    A([TRICK MODE STREAM]) --> B[Input MPEG-2 TS from which a trick mode clip will be extracted.]
    B --> C[Video elementary stream (VES) extracted.]
    B --> D[Audio elementary stream (AES) extracted.]
    C --> E[I frame extraction and valid PES formation.]
    E --> F[SNR scaling of the I-frames-only PES]
    F --> G[Freeze P frame insertion and valid PES formation.]
    G --> H[TS stream generation by multiplexing the above video PES into a system info (SI) and audio PES carrying TS skeleton.]
    D --> I[Selection and concatenation of the appropriate audio access units (from the original asset) based on the structure of the VES in the trick mode clip and valid PES encapsulation around these audio access units.]
    I --> H
    H --> J([END])

```

FIG. 1

FIG. 10



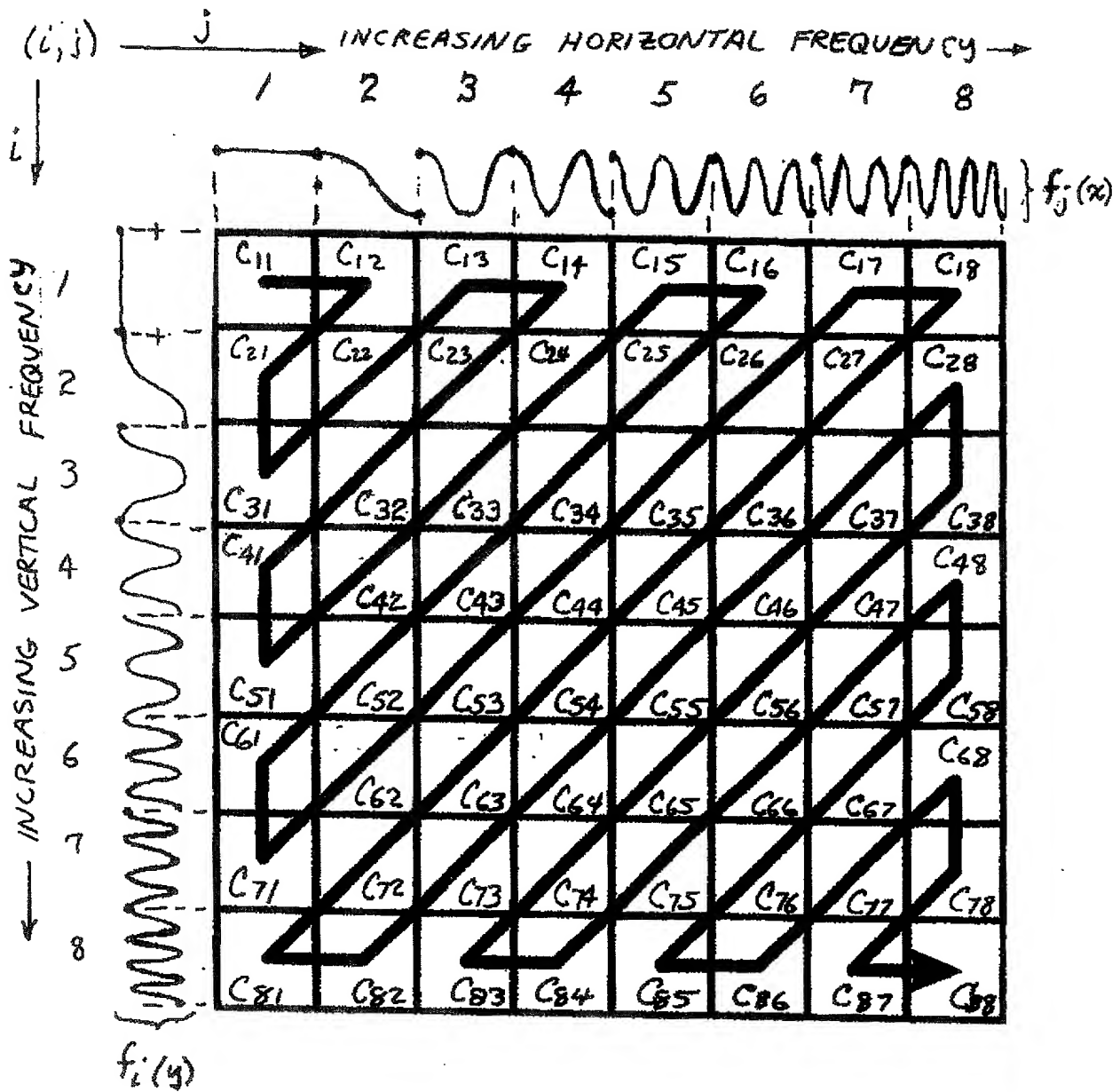


FIG. 11  
(PRIOR ART)

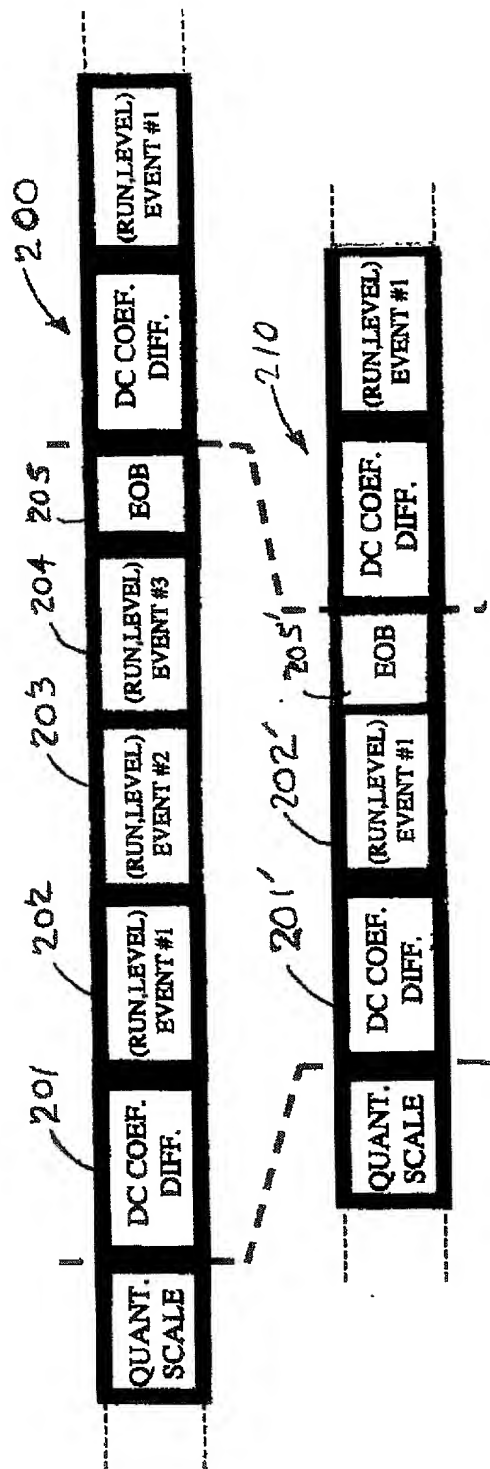
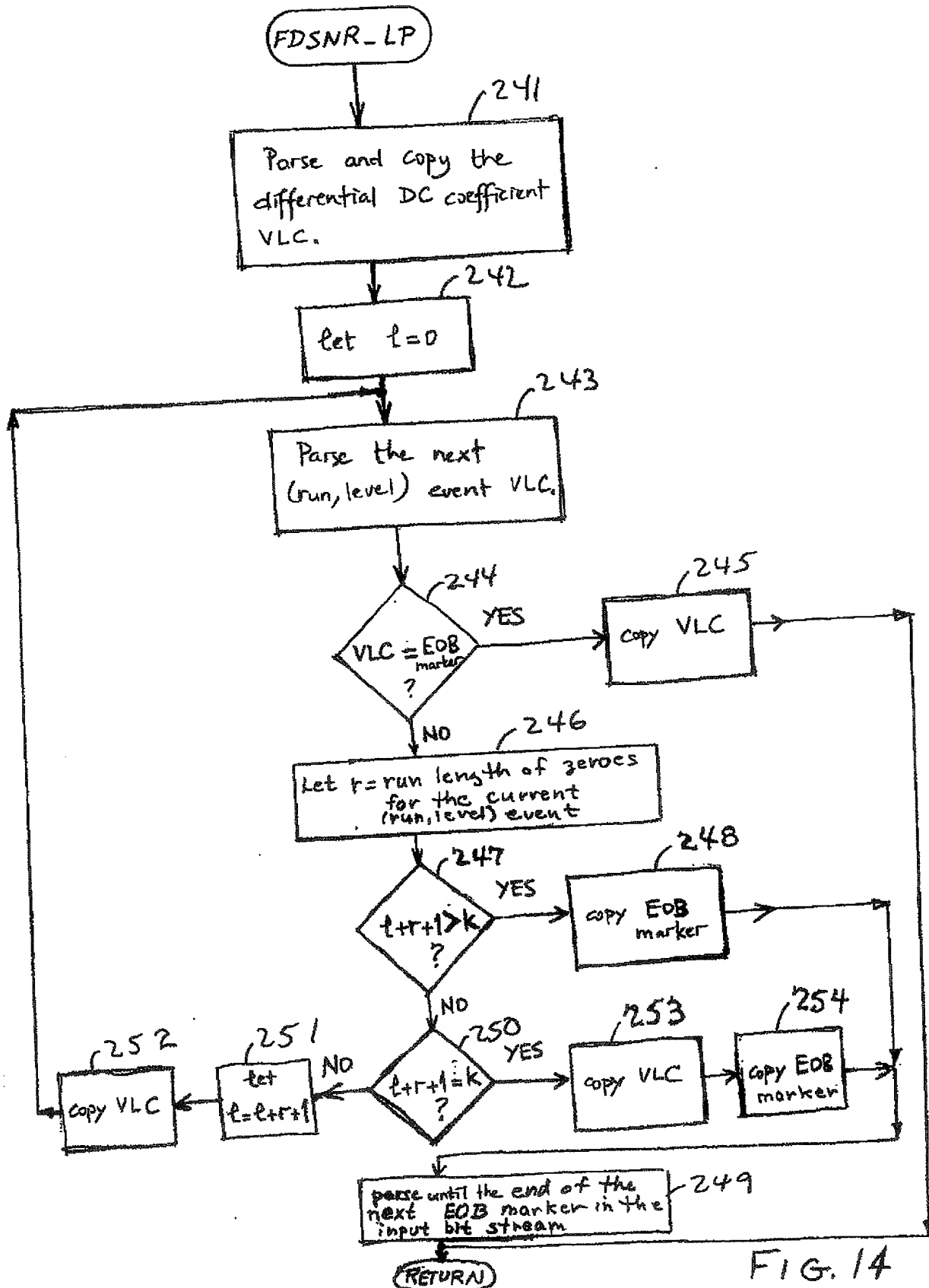
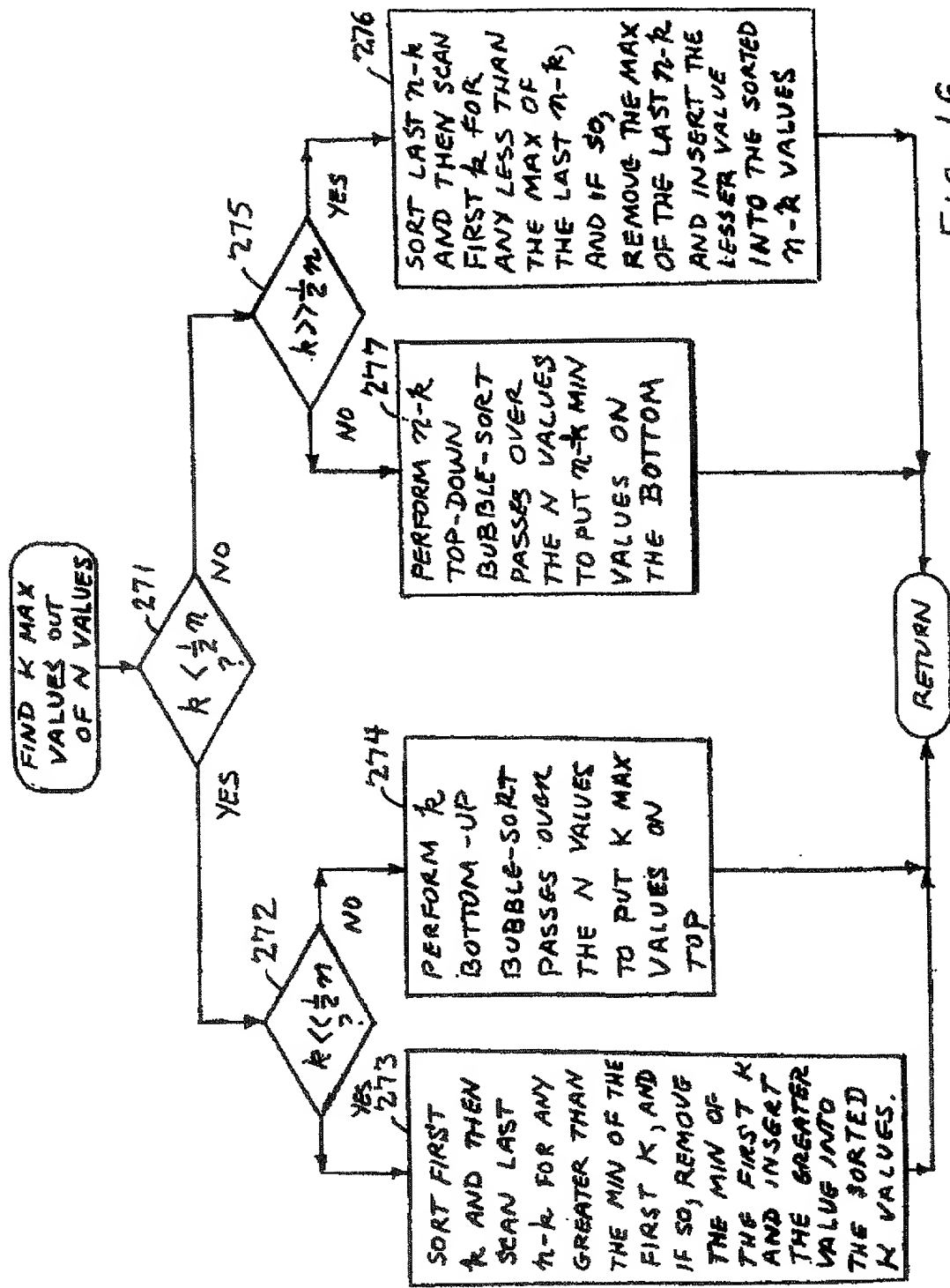


FIG. 12

FIG. 13

[illegible]





6/16/77

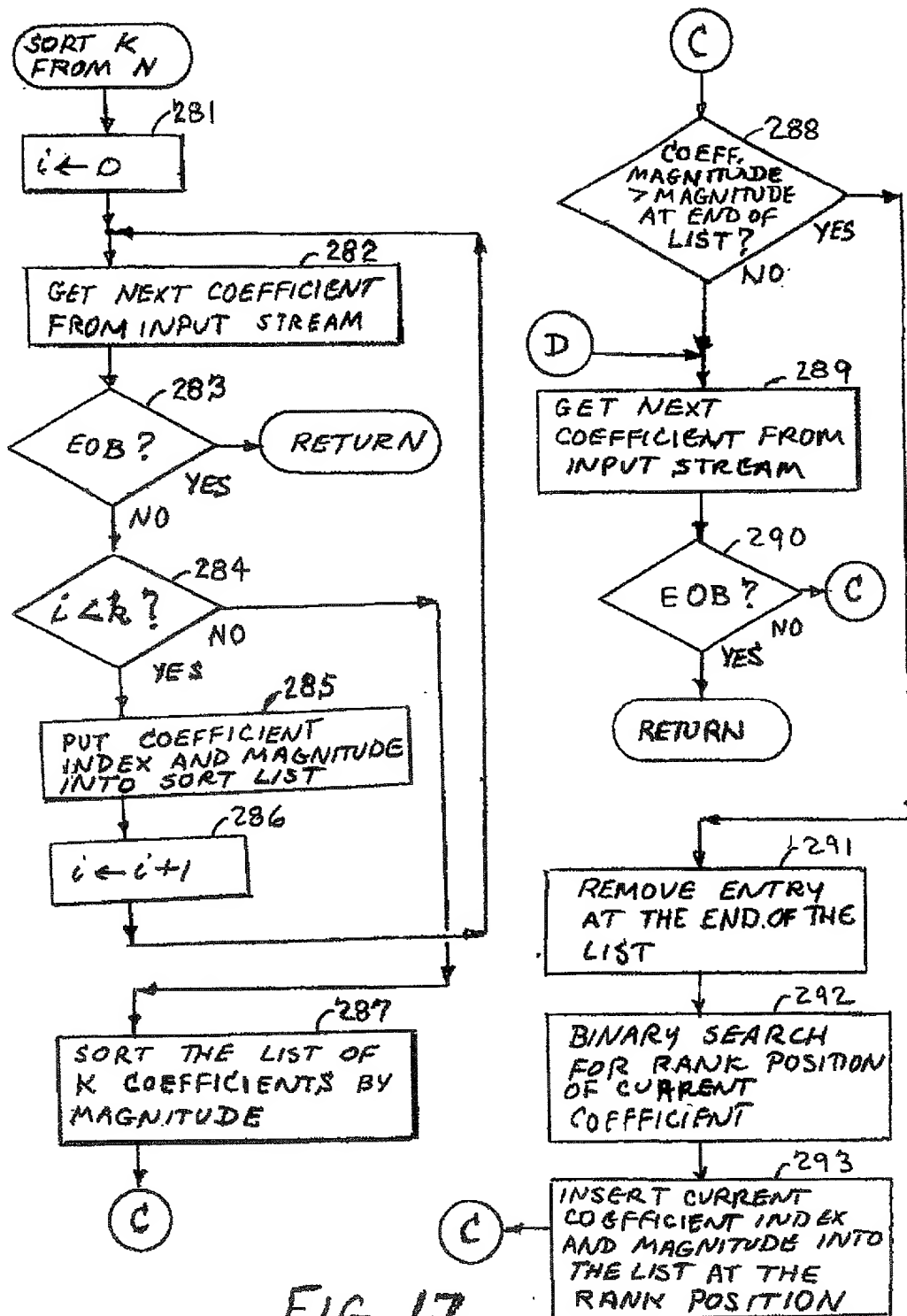


FIG. 17





```

graph TD
    Start([APPROXIMATE SORT K FROM N]) -- 311 --> Clear[311 CLEAR HASH TABLE]
    Clear -- 312 --> GetNext[312 GET NEXT COEFFICIENT FROM INPUT STREAM]
    GetNext -- 313 --> EOB{313 EOB ?}
    EOB -- YES --> Strip[314 STRIP HASH TABLE INDEX FROM MSBS OF COEFFICIENT MAGNITUDE]
    Strip -- 315 --> Insert[315 INSERT COEFFICIENT INDEX ON HASH LIST OF INDEXED HASH TABLE ENTRY]
    Insert -- 312 --> GetNext
    EOB -- NO --> IndexHash[316 INDEX HASH TABLE WITH i]
    IndexHash -- 316 --> EntryZero{318 ENTRY = 0 ?}
    EntryZero -- YES --> IZero{319 i = 0 ?}
    IZero -- YES --> Return1([RETURN])
    IZero -- NO --> DecI[320 i ← i - 1]
    DecI -- 318 --> EntryZero
    EntryZero -- NO --> GetNextEntry[321 GET NEXT ENTRY FROM HASH LIST AND PUT COEFFICIENT IN THE OUTPUT STREAM]
    GetNextEntry -- 322 --> EndList{322 END OF LIST ?}
    EndList -- YES --> EntryZero
    EndList -- NO --> DecJ[323 J ← J - 1]
    DecJ -- 324 --> JLe0{324 J ≤ 0 ?}
    JLe0 -- YES --> Return2([RETURN])
    JLe0 -- NO --> IndexHash

```

FIG. 19

MODIFIED  
FDSNR-LM

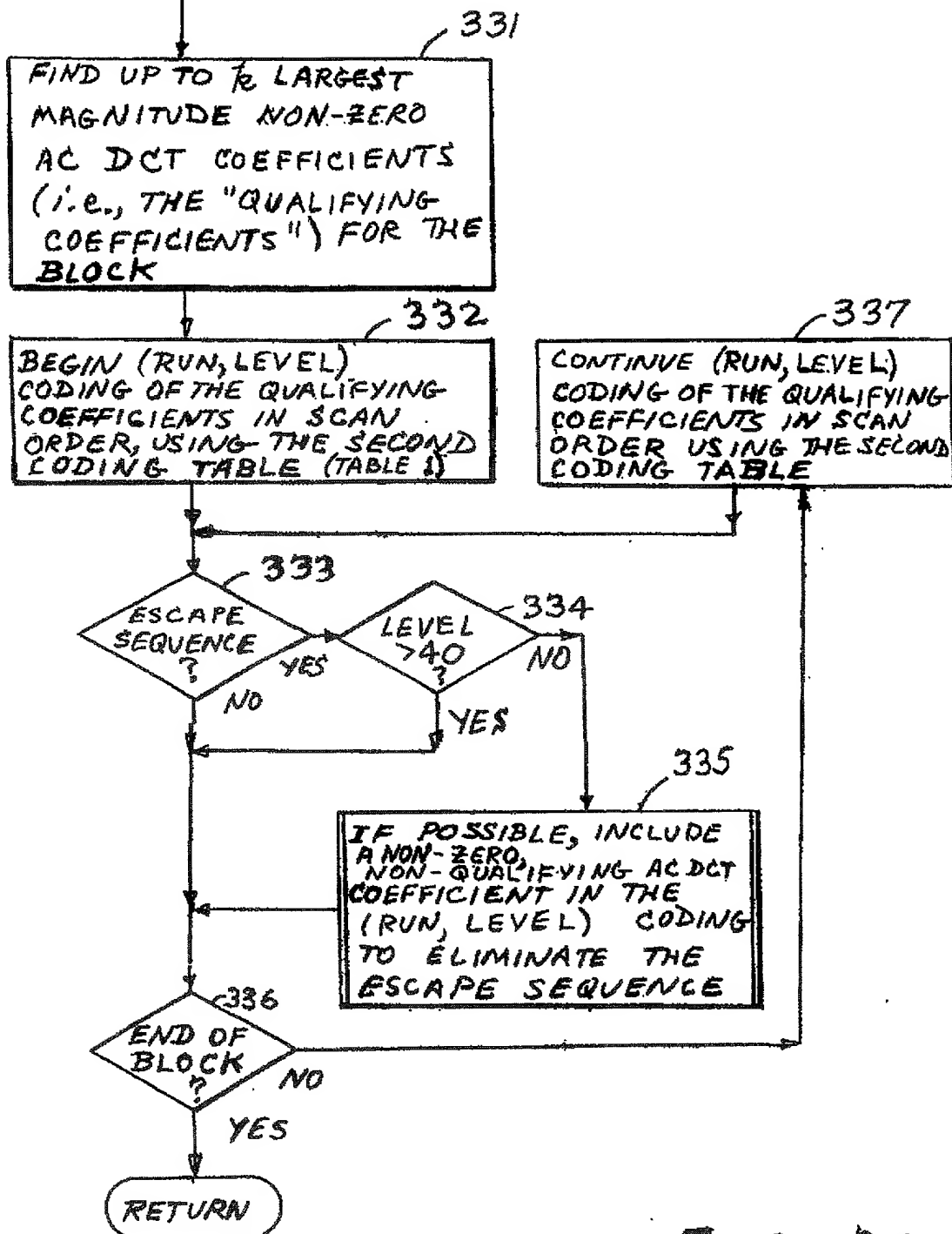


FIG. 20

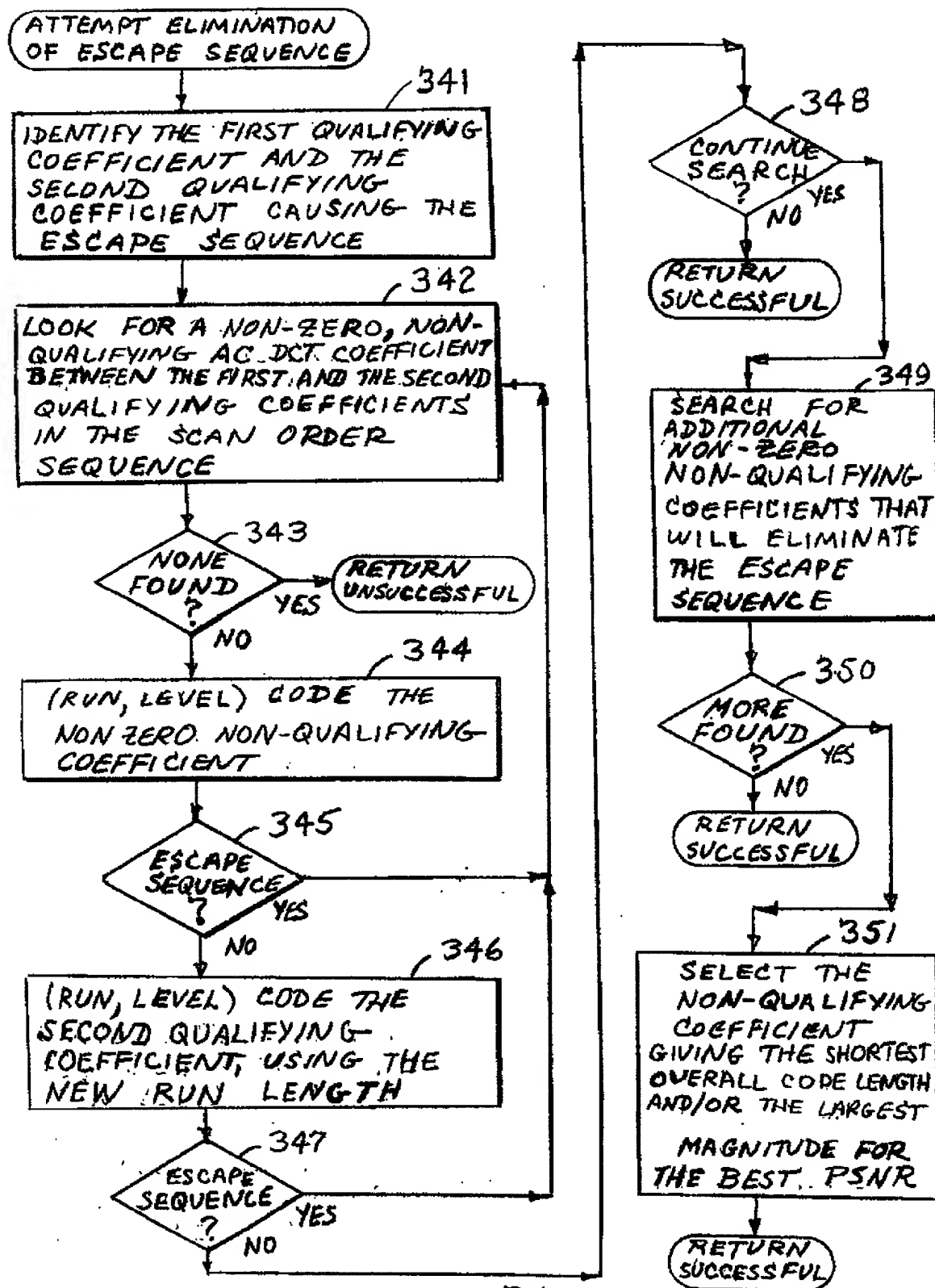
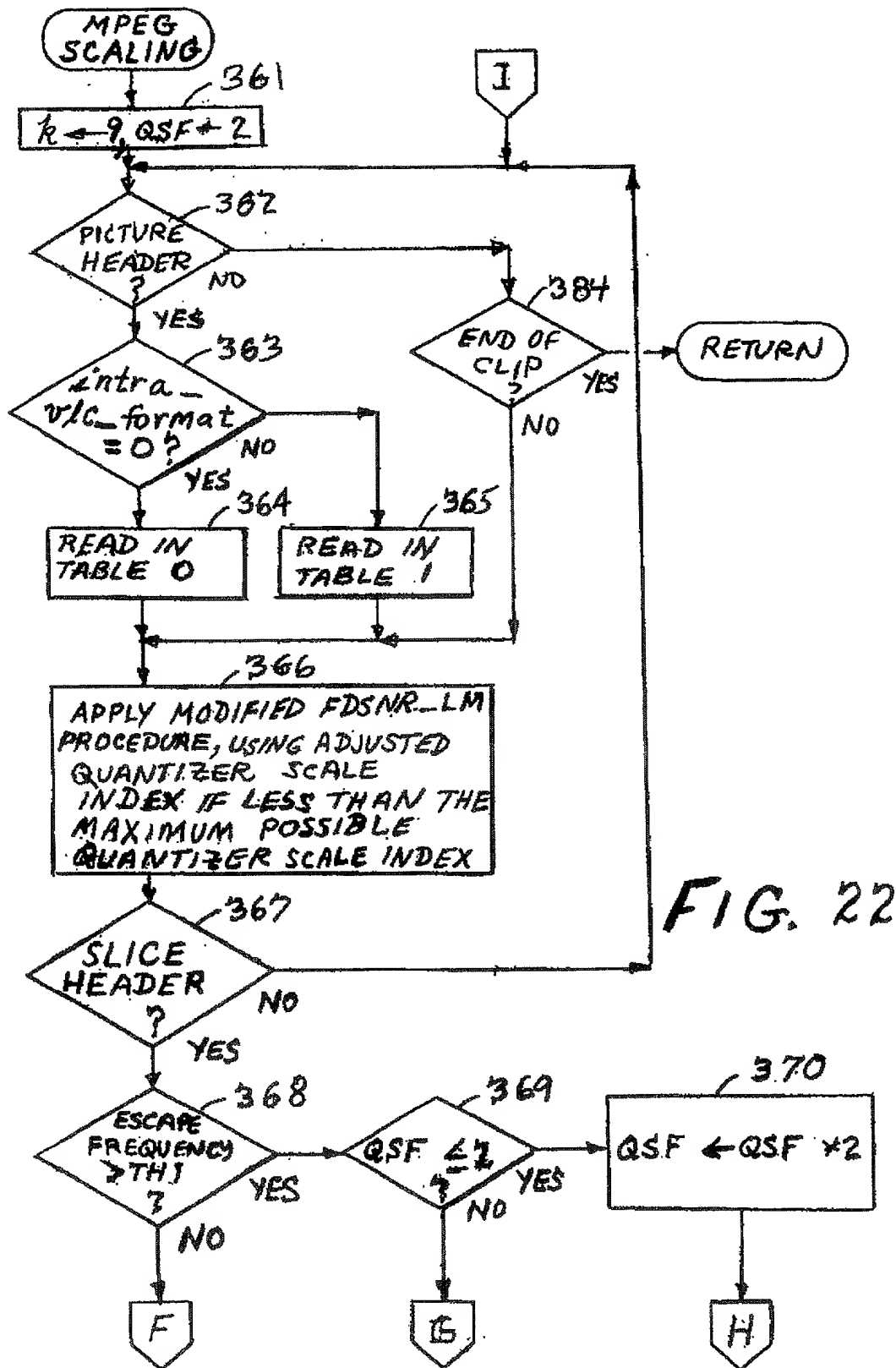


FIG. 21





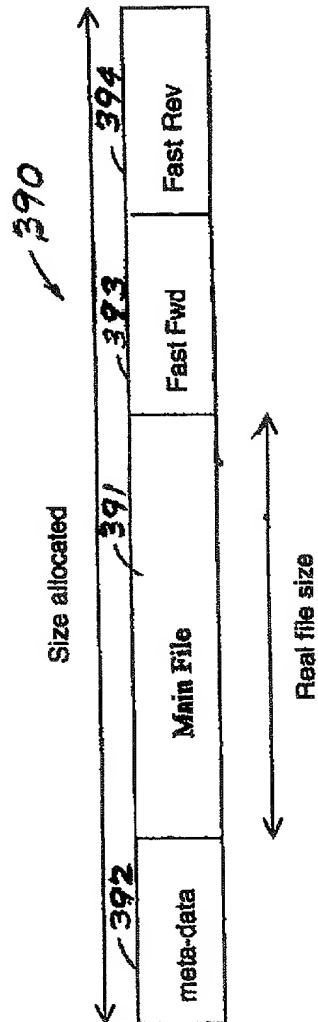


FIG. 24

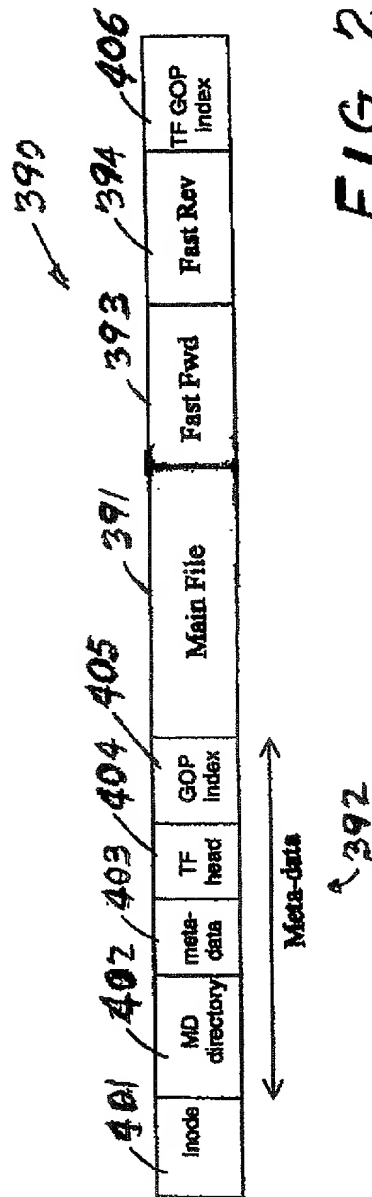


FIG. 25



	READ	WRITE
Copy of the asset with all the data	EMPEG2	EMPEG2
Copy only the main asset	RAW	MPEG2
Archive	EMPEG2	EMPEG2
Play	MPEG2	
Record		MPEG2

FIG. 27

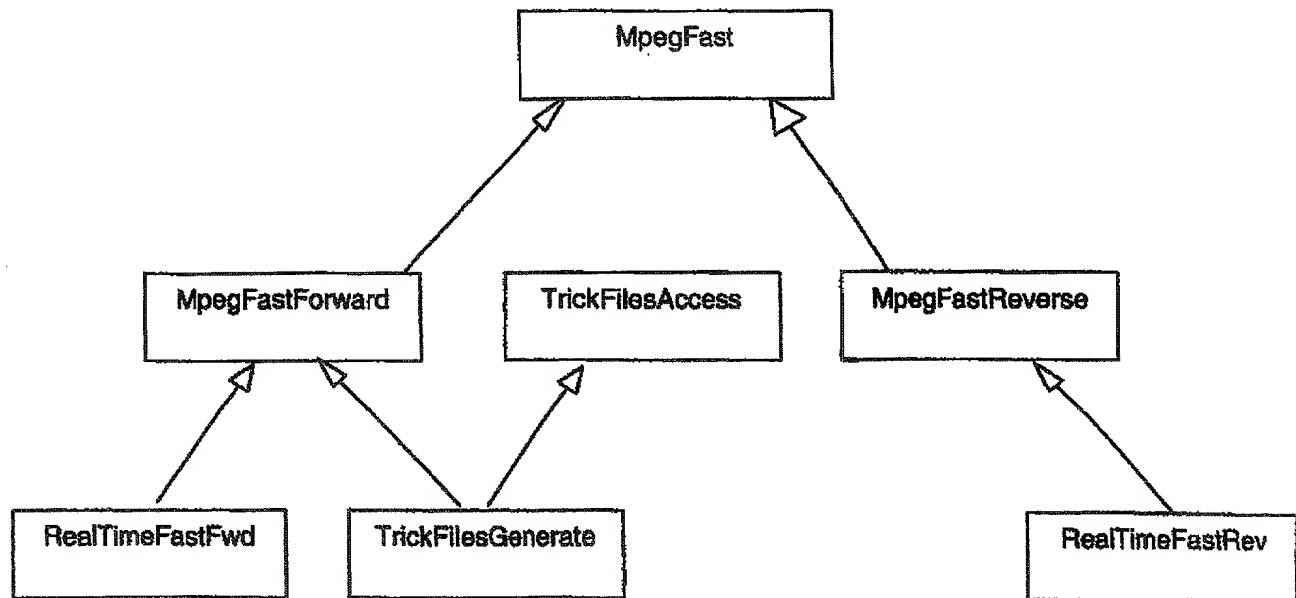


FIG. 28



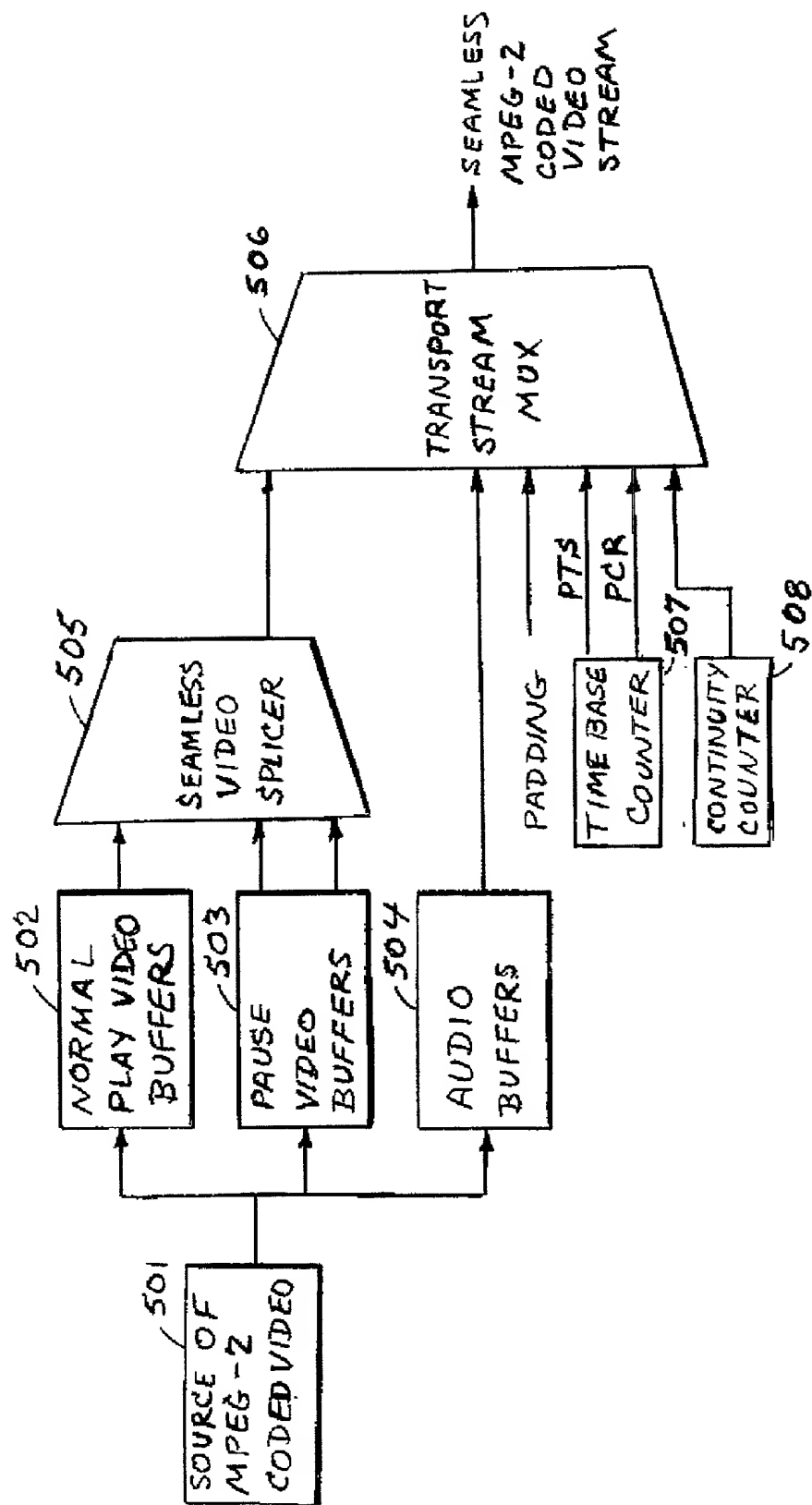


FIG. 29

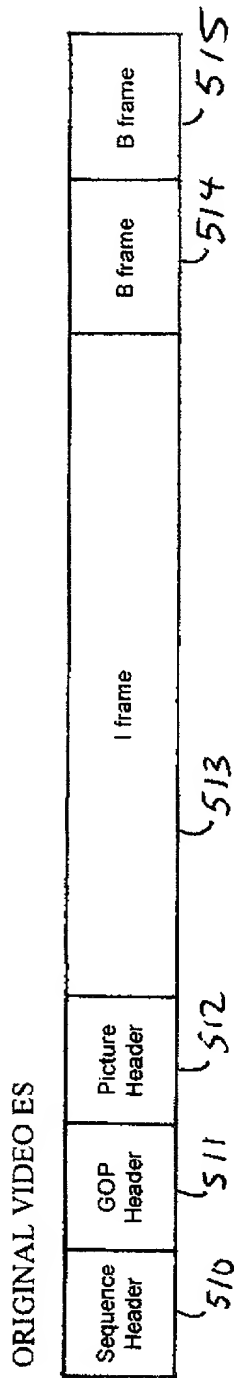


FIG. 30

P FREEZE FRAME ES

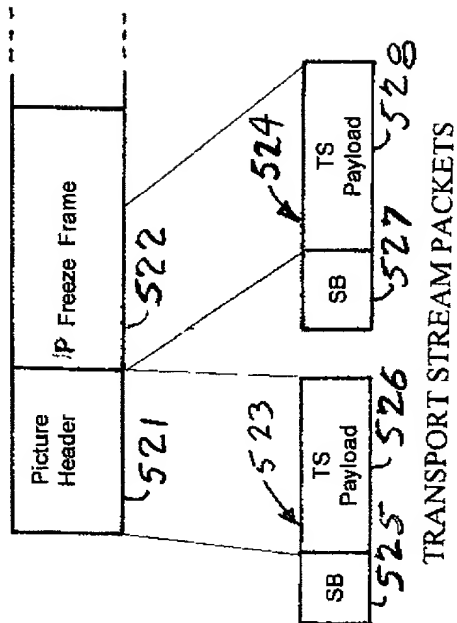


FIG. 31







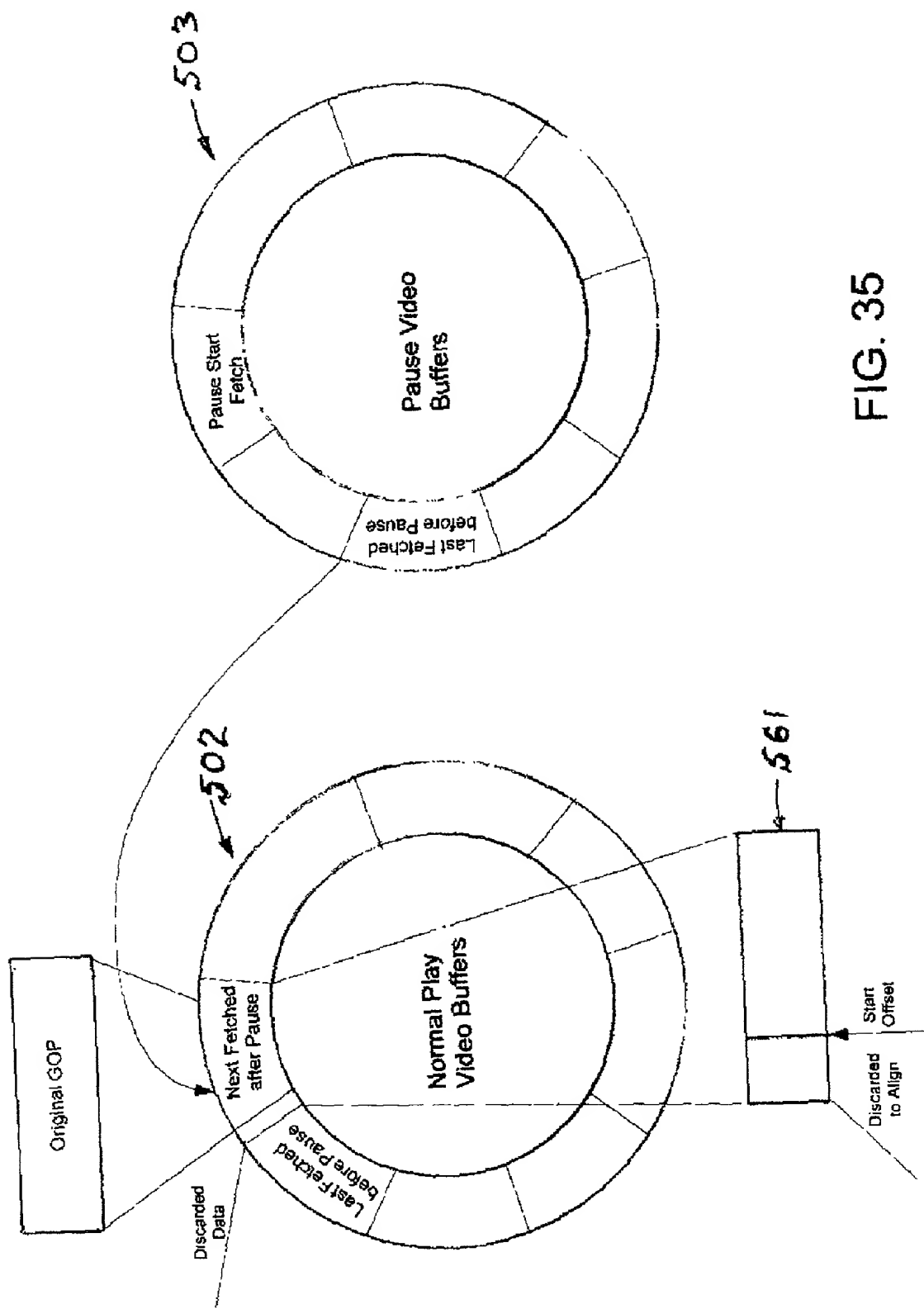


FIG. 35

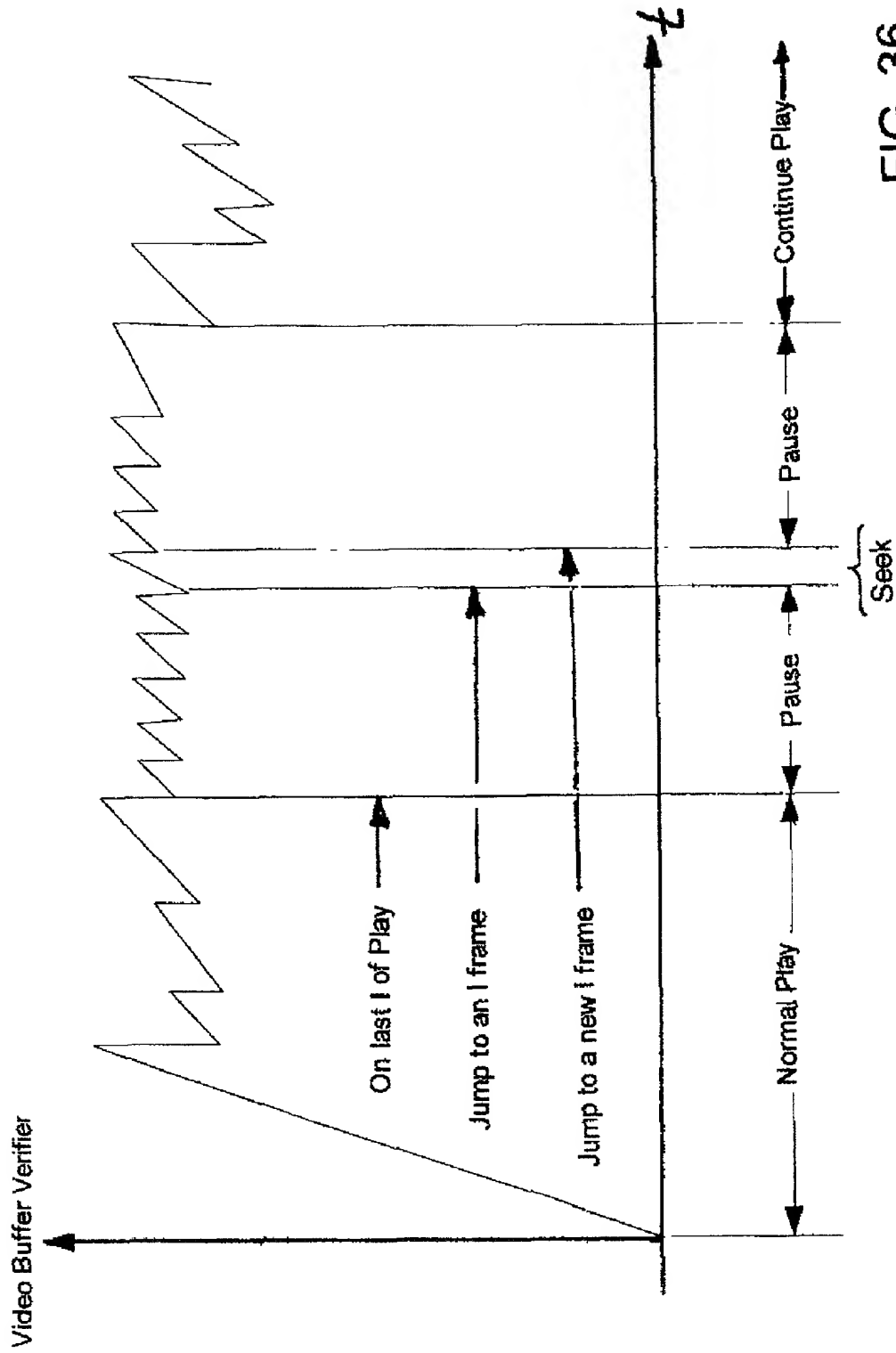


FIG. 36

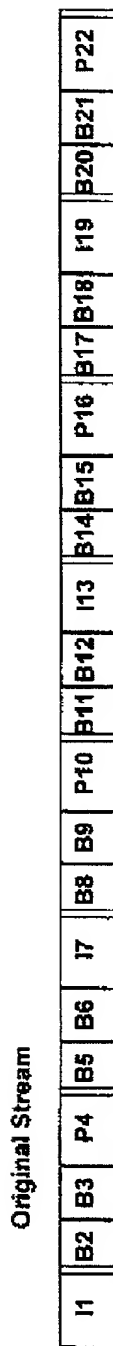


FIG. 37

Active Pause with Closed GOP

First case : Play - Pause

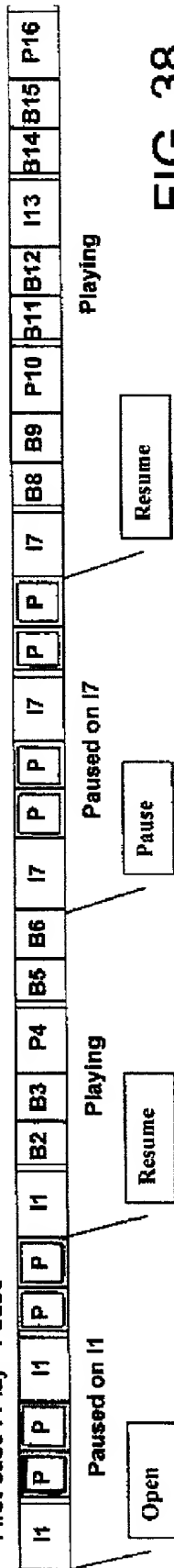


FIG. 38

Active Pause with Closed GOP

Second case : Play - Pause - seek

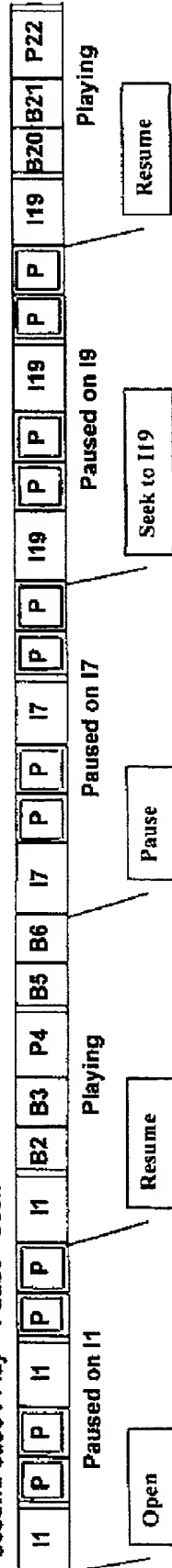
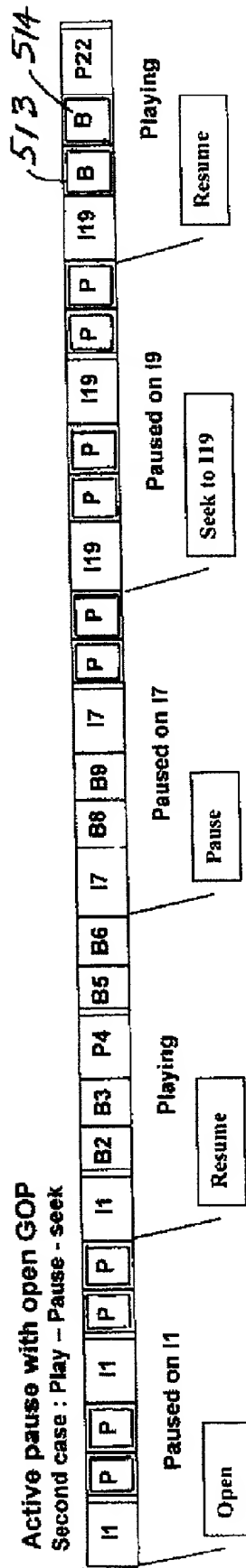
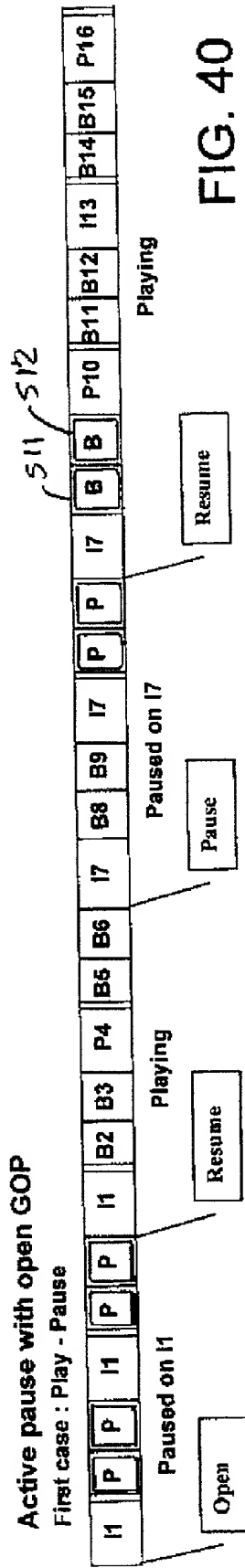


FIG. 39





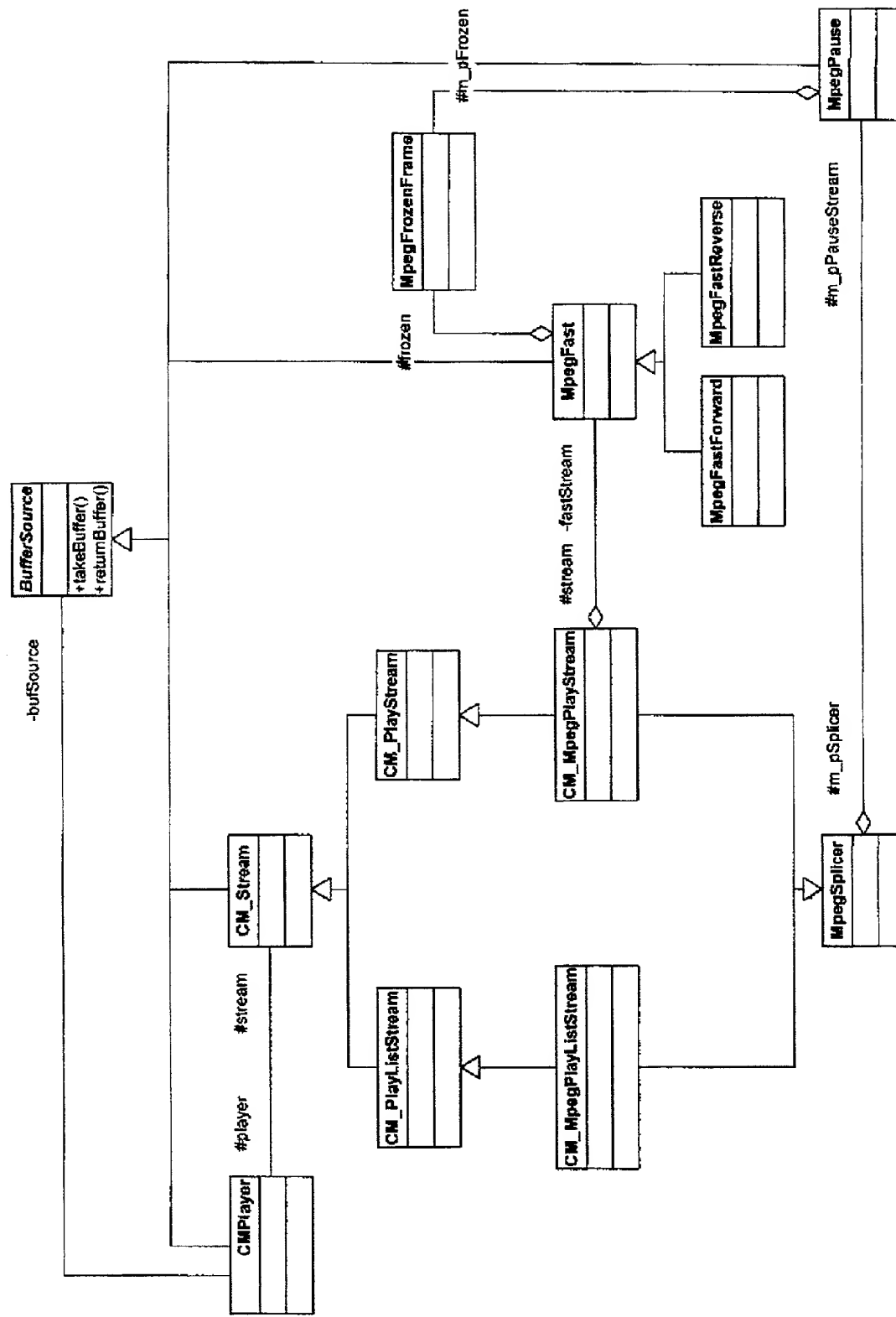


FIG. 42

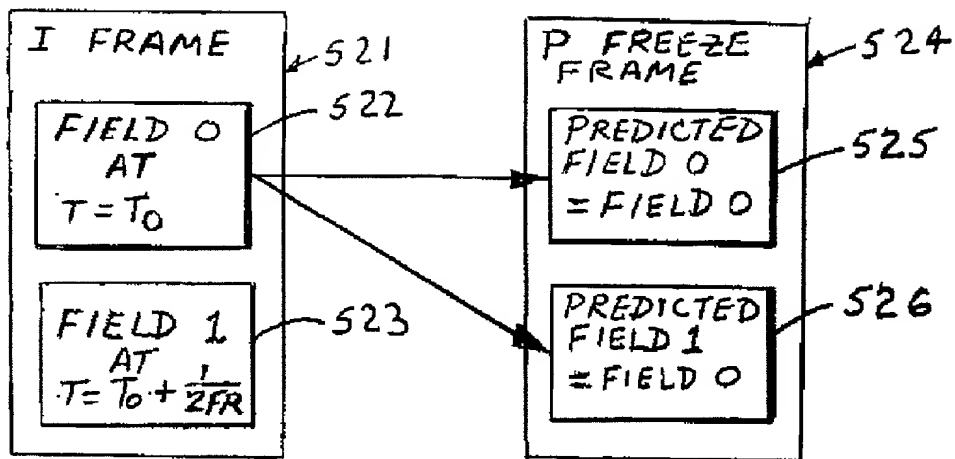


FIG. 43

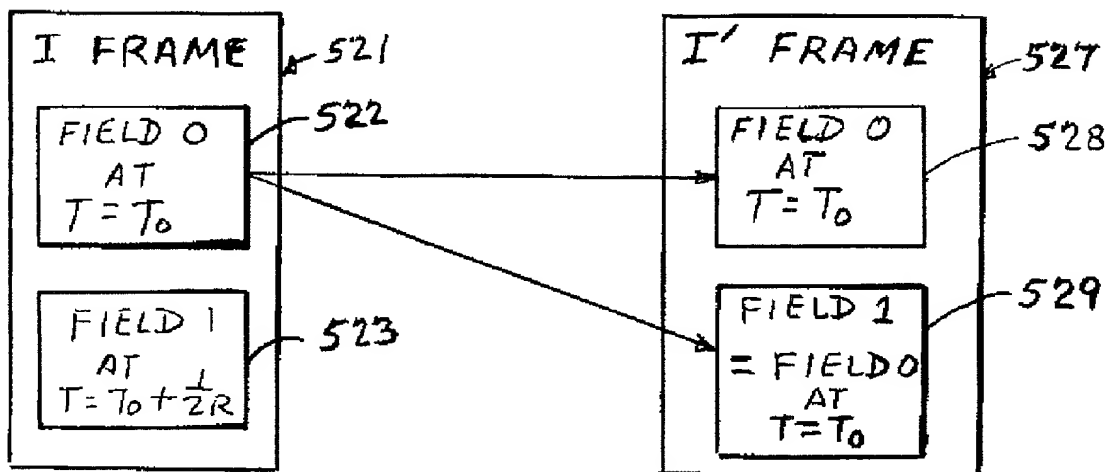


FIG. 44

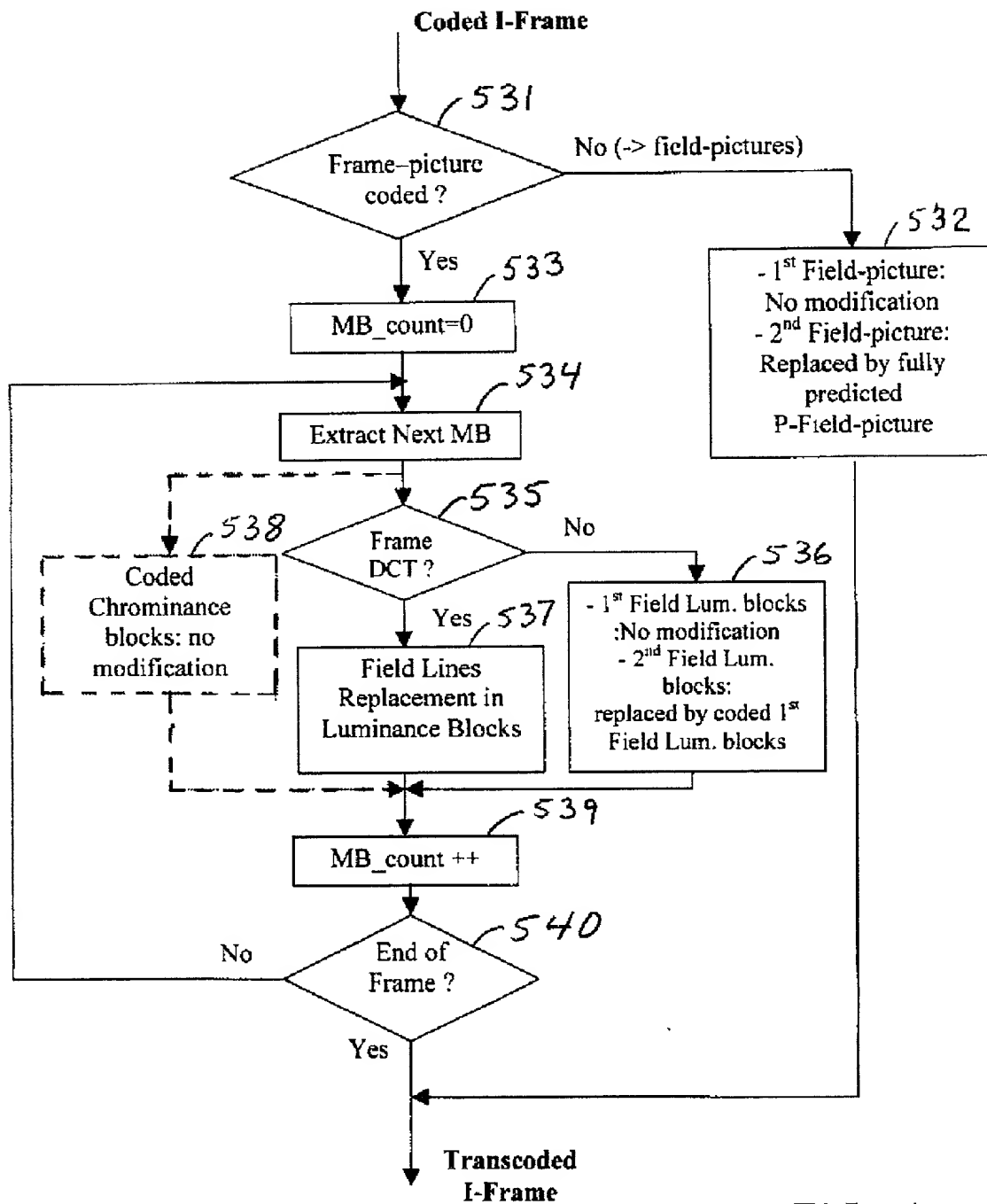


FIG. 45

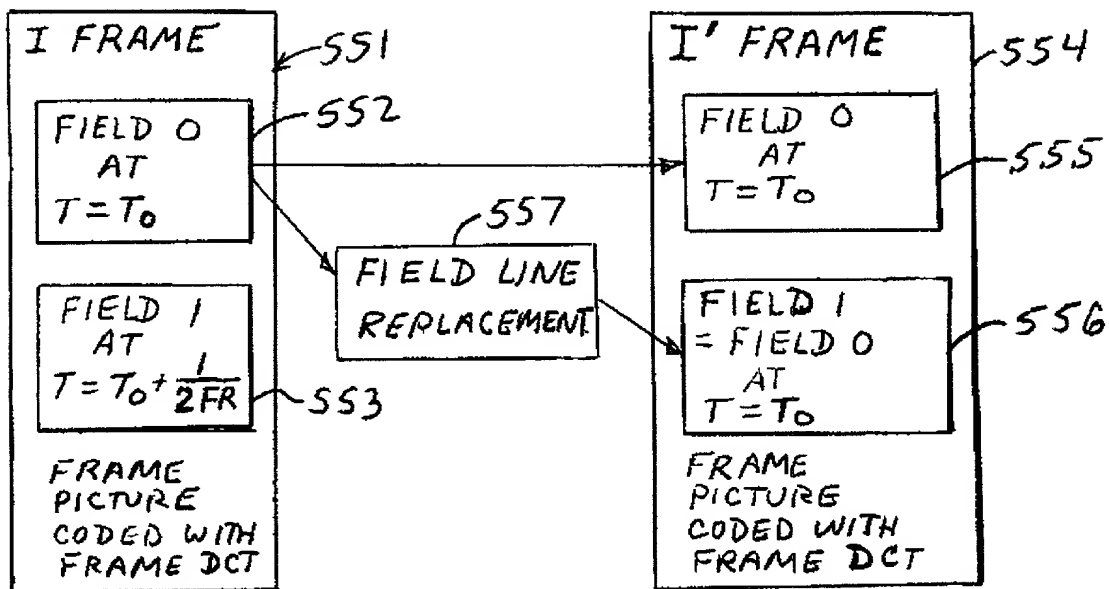


FIG. 46

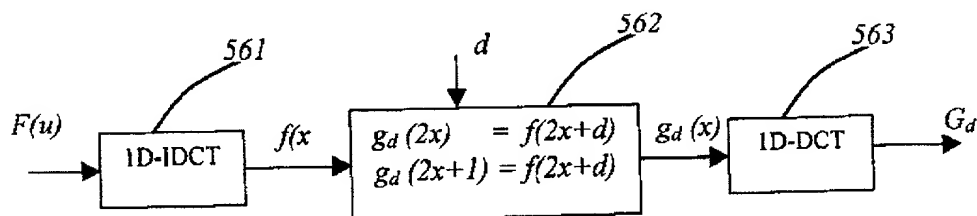


FIG. 47

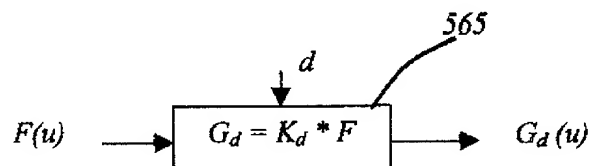


FIG. 48

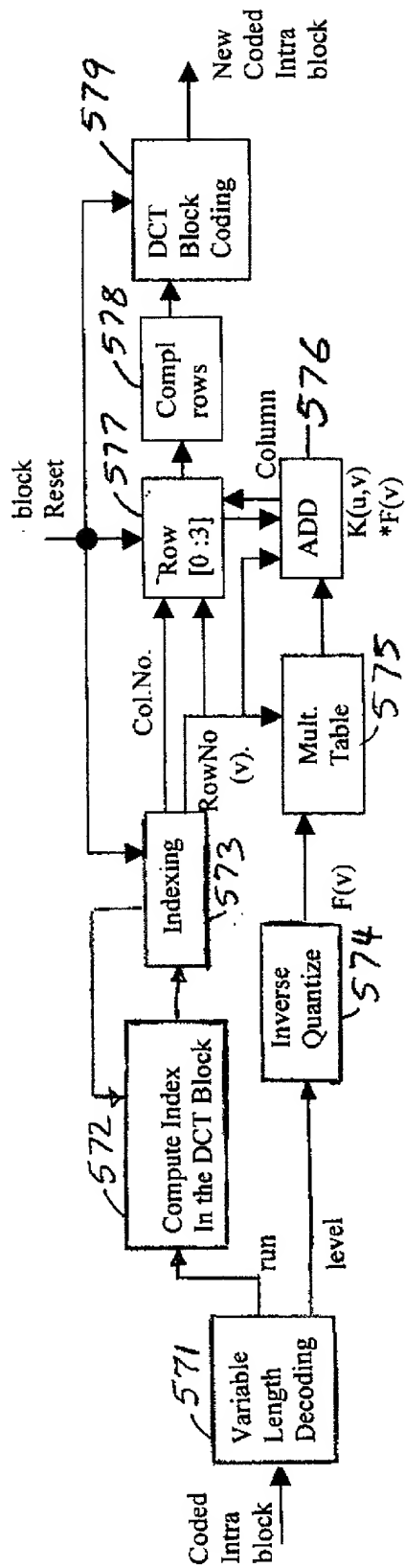


FIG. 49

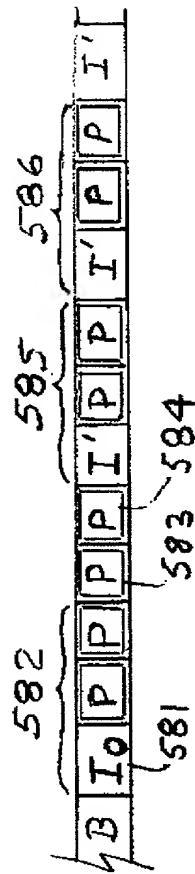


FIG. 50

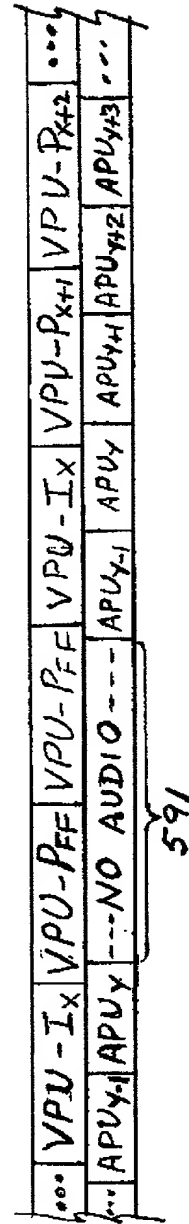


FIG. 52

**SLICE-BY-SLICE  
FIELD REPLACEMENT**

```
PUT SELECTED I FRAME
IN THE PAUSE VIDEO
BUFFERS
```

ACTIVATE BACKGROUND TASK  
OF REPLACEMENT OF A  
FIELD IN THE SELECTED  
I- FRAME BY TRANSCODING  
ON A SLICE-BY-SLICE BASIS

FIRST PLAY-OUT OF  
PAUSE GOP  
FROM THE PAUSE  
VIDEO BUFFER

```

graph TD
    A[604] --> B{TWO-STEP METHOD?}
    B -- YES --> C[ ]
    B -- NO (PROGRESSIVE) --> D[ ]
    style C fill:none,stroke:none
    style D fill:none,stroke:none

```

```

graph LR
    605{BACKGROUND TASK DONE ?} -- YES --> 606[ ]
    605 -- NO --> 606
    style 606 fill:none,stroke:none
  
```

PLAY  
P FREEZE  
FRAME

CONTINUE REPLAY  
OF THE PAUSE GOP

FIG. 51